EXECUTIVE SUMMARY

An Organizational Guide to Pollution Prevention provides information to help organizations get P2 programs started or to re-evaluate existing P2 programs. It presents an alternative method for working on P2 projects and four approaches to implementing a P2 program in an organization. This *Guide* was not written to provide a "one-size-fits-all" formula for starting or improving a P2 Program. The intention is to spark some ideas and provide tools that can be used to successfully complete an organization's P2 mission.

Also, the *Guide* is *not* intended to be an exhaustive review of case studies and company examples. It does not include information on state P2 planning requirements. In order to keep this document a reasonable length, these examples have been cited in the references section, and supplemental information is provided on the CD-ROM that accompanies this *Guide*. There are many U.S. Environmental Protection Agency (EPA) programs that support the practice of P2, including Environmental Accounting Project, Design for Environment, P2 Resource Exchange, Environmentally Preferable Purchasing, Sustainable Industry Project, Performance Track Program, and other initiatives across the Agency. Internet links to these programs and other information are provided on the CD-ROM.

An Organizational Guide to Pollution Prevention is organized into three basic sections:

1.	**Basic P2 Concepts and Tools (Chapters 1-4)**	Introduction to P2, Getting Started, P2 Program Elements, and P2 Tools
2.	**P2 Program Implementation Approaches (Chapters 5-8)**	Traditional Approach, EMS Approach, Quality Approach, and Finding Your Own Way to Implement P2
3.	**Companion CD-ROM**	Supporting P2 Information

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E.1 Introduction to P2

P2 has evolved substantially in its first decade. In 1988, the EPA published the *Waste Minimization Opportunity Assessment Manual* (EPA/625/7-88/003). This publication was revised and reissued in 1992 as the *Facility Pollution Prevention Guide* (EPA/600/R-92-088). Large numbers of these publications were distributed in the United States and internationally, and the information was well received. These publications have been included on the CD-ROM.

P2 programs provide many benefits to the organizations that use them. These include:

- Reduced operating costs
- Improved worker safety
- Reduced compliance costs
- Increased productivity
- Increased environmental protection
- Reduced exposure to future liability costs
- Continual improvement
- Resource conservation
- Enhanced public image

There are a number of impediments that P2 programs must address. These include:

- Capital requirements
- Specifications
- Regulatory issues
- Product quality issues
- Customers' acceptance
- Immediate production concerns
- Organization image concerns
- Available time/technical expertise

A five-step model is presented showing an alternative approach using the P2 tools discussed later in this *Guide* (Chapter 4). This is contrasted to the traditional approach to P2.

E.2 Getting Started With P2

Chapter 2 provides information on getting started with the P2 program process. First, set the boundaries around the program by deciding how P2 will be defined. Definitions from the EPA, United Nations Environment Program, and the World Business Council for Sustainable Development are presented. The user can choose to add elements from cleaner production and eco-efficiency to create a unique P2 definition that is broader than EPA's definition.

It is possible to use the P2 program to help an organization attain a goal of sustainable development. In addition, it is possible to integrate P2 into core business practices like six sigma, zero waste, and other company programs such as:

- Environmental management systems (EMS)
- Quality management initiatives
- Preventive maintenance
- Health and safety programs
- Insurance/risk management

Although a commitment to the P2 program should begin with management (i.e., top-down approach), line employees can often suggest valuable improvements in operations and procedures (i.e., bottom-up approach). The P2 tools presented in this *Guide* are well suited for encouraging employee participation as well as management recognition.

There is a substantial body of literature that describes, analyzes, and evaluates P2 efforts in the United States and internationally. It is clear that, like quality, P2 is a mindset that needs to permeate into the culture of the organization. Some have said that P2 is a way of life, not a new program. P2 requires many changes in behavior that cannot be simply demanded. Empowering employee teams to fully implement the new P2 behaviors is central to successful change management.

E.3 P2 Program Elements

P2 program planning should begin with the preparation of a *vision statement*, a *mission statement*, and a *statement of goals*. If your organization already has formal statements, it is important to align the P2 program with these statements. These statements and goals will help provide a good foundation for the P2 plan that your organization develops. Next, it is important to see how the P2 program aligns with the organization's guiding principles (also known as the core values). These items will help ensure that the program is understood and compatible with other initiatives in the organization.

The EPA has found that P2 programs often have similar program elements. They have published in the *Federal Register* six important elements that would be found in many programs of this nature. These elements include the following:

1. Provide top management support
2. Characterize the process
3. Perform periodic assessments
4. Maintain a cost allocation system
5. Encourage technology transfer
6. Conduct program evaluations

There may be other elements that can be included in the organization's P2 program. One good source is the American Chemistry Council's Responsible Care® Program's P2 Code. In addition, the organization must be certain to include the planning requirements that may be specified in its state environmental regulations.

To be truly successful, P2 requires a systematic, integrated, consistent, and organization-wide approach. This approach can be achieved through comprehensive P2 planning. Although you can learn from others' P2 success stories, real P2 success comes from the persistent application of the P2 philosophy and guiding principles in each organization's specific environment. Success is measured differently in each organization. It cannot be achieved simply by copying others.

E.4 P2 Tools

P2 teams can use a variety of specialized tools. These tools provide visual aids that are essential for communicating P2 information to management, other workers, and other interested parties. Tools also help P2 teams gather information and provide problem-solving and decision-making guidance. Finally, by using the tools, the P2 team is in a better position to construct an action plan for each P2 project included in the program. This allows for consistent tracking by the P2 oversight committee.

P2 tools are Systems Approach tools. The Systems Approach looks at the whole organization, and the parts, and the connections among the parts. These tools help point out how things can be changed to conserve the use of a resource or prevent the waste from occurring. This is fundamentally different from having an external assistance provider suggesting a way to change the process without considering the system.

These P2 tools are derived from quality programs and are widely used throughout the world. The application of the quality improvement tools used in the Systems Approach is a powerful force in eliminating environmental inefficiencies and preventing pollution.

The P2 tools are:

- Process characterization with hierarchical process mapping
- Resource accounting using the process maps as a template
- Selection of P2 opportunities using a Pareto diagram with appropriate cost information
- Analysis of the root cause of the problem using a cause-and-effect diagram
- Generation of alternative solutions using brainwriting
- Selection of an alternative for implementation using bubble-up/bubble-down
- Implementation of the alternative using an action plan

Checklists are also useful to help the P2 teams review the process and ensure that their work is complete.

Tools take time to master, but they help foster skills that the P2 team needs to characterize the process, solve problems, and make decisions. Making P2 a way of life takes more than words; it requires action. Action plans provide documentation for accomplishing the goals decided upon by using the tools. It makes it easier to track P2 progress over time.

E.5 Traditional Approach to P2 Implementation

The P2 approach provided in the previous EPA publications is presented along with process maps depicting each of the steps. This traditional approach has a “top-down” focus. It starts with getting management approval with pre-set program goals. This is communicated to the workforce using a policy statement. A P2 task force is organized and conducts a preliminary P2 assessment.

From this information, a P2 program plan is prepared with clear objectives and a firm schedule. Now a detailed P2 assessment is conducted to start the implementation phase. Checklists and worksheets are provided to help the team collect data and information. This assessment team will review the data and visit the sites where the P2 activity is planned to take place.

The team will derive P2 options (called *alternatives* in this *Guide*) and screen them with a criteria matrix. A feasibility analysis is performed to make a final determination based on technical, environmental, and economic factors. At this point, the traditional approach requires the preparation of a formal, written P2 assessment report to present the analysis to management for a decision.

Once the work begins, it is reviewed and adjusted to make sure it meets the objectives. The final step in the traditional program is to measure P2 progress. Data is acquired from the implementation phase and analyzed.

Previous P2 publications provide guidance on how to maintain the P2 program. Five activities are detailed as follows:

- Integrating the P2 program into other formal corporate initiatives
- Providing the proper amount of P2 education
- Communicating and soliciting of suggestions
- Providing for proper incentives for participating
- Implementing public outreach and education

P2 practitioners found this approach to be useful for very small organizations. Another method, called *Nothing to Waste*, has also been shown to be very effective with very small organizations and uses the tools presented in Chapter 4.

E.6 EMS Approach to P2 Implementation

The international voluntary standard for environmental management systems (EMS), known as ISO 14001, is an effective tool for implementing P2 alternatives. It is the intent of this standard to establish and maintain a systematic management plan designed to continually identify and reduce the environmental impacts resulting from an organization's activities, products, and services. An EMS promotes important planning and improvement elements needed in the design of multimedia source reduction and recycling programs.

As an initial step in developing a comprehensive EMS, most organizations find it helpful to complete an objective gap analysis of their existing environmental system. This enables the organization to compare its systems against ISO 14001 and highlight areas that require attention under the EMS development phase.

The preparation of the EMS includes the following steps:

- Environmental policy, management commitment, and scope of the EMS
- Communication of the EMS policy
- EMS planning
- EMS implementation
- Monitoring and measurement

An EMS establishes specific objectives, targets, and time frames for implementing P2 initiatives, improving environmental performance, and maintaining compliance, including compliance with state P2 planning requirements. Environmental management programs (EMP) are used to achieve the EMS objectives and targets.

Organizations are discovering that their investment in an EMS is leading to improved environmental performance and compliance with benefits for the environment and the community. An EMS provides a good method for establishing and implementing a P2 program. To achieve maximum environmental benefits, the EMS should embody the "plan, do, check, and act" model for continual improvement.

E.7 Using a Quality Model to Implement P2

P2 results are the *outcomes* of the *performance* of the P2 program and **not** a measure of the performance itself. Furthermore, P2 results by themselves offer little diagnostic value. They do not indicate whether an organization could have done better or if they really exceeded expectations. A model that focuses on measuring performance has been developed in the United States and is known as the Malcolm Baldrige National Quality Award. It measures six performance categories (i.e., leadership, strategic planning, other interested party involvement, information and analysis, employee participation, and process management). A seventh category captures the results. The Green Zia Program (New Mexico Environment Department) has adapted this quality model to measure environmental excellence. From the perspective of the organizations using this model, it is a prevention-focused, performance-driven EMS. Performance can be measured on a 1,000-point scale. This is a unit-less number and does not need to be normalized like other environmental metrics. Results are measured in three parts: environmental results, results of the interested party involvement, and financial results.

In order to increase the performance score, organizations must demonstrate how they leverage the various performance activities with other performance criteria. The organization also needs to find a way to integrate each of the eleven guiding principles with the proper criteria in the model. This facilitates the integration of the P2 program into the organization.

A five-step process is offered to improve or develop a P2 plan using the quality model concepts. The steps are as follows:

1. Plan and develop your P2 program
2. Develop your facility's P2 opportunities
3. Implement your P2 program alternatives
4. Maintain your P2 program
5. Measure your progress toward zero waste and emissions

The use of the Systems Approach and the quality model provides a means of creating a sustainable P2 plan for your organization. Your ISO 14001, Global Reporting Initiative, CERES Principles, Responsible Care® Program, balanced scorecard, six sigma, ISO 9000, and other environmental and quality initiatives will help the organization score points in each of the criteria. All these programs help contribute to environmental excellence. This quality model simply provides a means of providing a common thread on how they are related and allows you to see just how effective they are at driving environmental performance in your organization.

The P2 plan should be integrated with the core business practices. "Oh, that is something that the environmental coordinator is doing!" – such an attitude can only limit results. By making the P2 plan more businesslike, the possibilities for P2 within the organization are significantly enhanced.

E.8 Finding Your Own Way to Implement P2

Three approaches to implementing a P2 program have been presented in Chapters 5–7. This chapter discusses some of the items that are covered in these approaches to provide you with some ideas for planning and implementing a P2 program that is specific to your organization's requirements and culture. The following categories are presented that a P2 program could choose to address:

- Extent of planning
- Leadership
- P2 goal setting
- Focus on results
- Information and analysis
- Process management
- Employee participation
- Focus on interested parties
- Guiding principles or core values
- P2 program elements

E-9. CD-ROM

This *Guide* has been issued with a companion CD-ROM. It provides supporting information on all the topics and additional materials that may be required to plan and implement a P2 plan for your organization.

All the referenced material is accessible using the CD-ROM, including the previous EPA P2 publications and associated checklists. Information on a large number of EPA and state P2 activities is also included. The CD-ROM is divided into the following sections:

- P2 checklists
- Links to information on the P2 tools
- Information on EMS to support P2 implementation
- Information on the quality (Green Zia) model to support P2 implementation
- Other P2 manuals
- Other sources of useful P2 information